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6-13-96

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Pyriproxyfen (129032): review of aquatic plant (*Lemna gibba*) toxicity study (122-2); D225442; S503789; Case 031299; McLaughlin Gormley King Co.

FROM: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

6-13-96

TO: Rick Keigwin/Joseph Tavano
Product Manager 10
Registration Division (7505C)

EEB has completed its review of the aquatic plant toxicity study submitted by McLaughlin Gormley King Co. to support registration of pyriproxyfen. The DER is attached. The following citation and comments apply to this study:

**Citation:** Hoberg, J. R. 1996. Toxicity to duckweed, *Lemna gibba*. Conducted by Springborn Laboratories, Inc., Wareham, MA. Lab. Report # 96-1-6354. Sponsored by Sumitomo Chemical Company, Osaka, Japan. MRID No. 439583-01.

| Guideline | MRID No. | Acceptability |
|---|---|---|
| 122-2 | 439583-01 | yes |

**Comments:** The study is considered core for a Tier I test (122-2). Because inhibition of frond growth was <50% at a test concentration exceeding the maximum label application rate of 0.1 lb ai/acre, Tier II testing is not required for *Lemna gibba*.

Contact Bill Erickson at 305-6212 or Harry Craven at 305-5320 if you have any questions about this review.

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DP Barcode : D225442
PC Code No : 129032
EEB Out :

To: Rick Keigwin/Joseph Tavano
Product Manager 10
Registration Division (7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (7507C)

Attached, please find the EEB review of...

Reg./File # : 1021-Ratn Nylar Fire Ant Bait 2629
Chemical Name : Pyriproxyfen
Type Product : Insecticide
Product Name :
Company Name : McLaughlin Gormley King Co.
Purpose : Aquatic plant toxicity study - *Lemna gibba*

Action Code : 116 Date Due : 08/13/96
Reviewer : William Erickson Date In : 04/19/96

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

| Gdln No. | MRID No. | Cat. | Gdln No. | MRID No. | Cat. | Gdln No. | MRID No. | Cat. |
|---|---|---|---|---|---|---|---|---|
| 71-1(a) | | | 72-2(a) | | | 72-7(a) | | |
| 71-1(b) | | | 72-2(b) | | | 72-7(b) | | |
| 71-2(a) | | | 72-3(a) | | | 122-1(a) | | |
| 71-2(b) | | | 72-3(b) | | | 122-1(b) | | |
| 71-3 | | | 72-3(c) | | | 122-2 | 439583-01 | Y |
| 71-4(a) | | | 72-3(d) | | | 123-1(a) | | |
| 71-4(b) | | | 72-3(e) | | | 123-1(b) | | |
| 71-5(a) | | | 72-3(f) | | | 123-2 | | |
| 71-5(b) | | | 72-4(a) | | | 124-1 | | |
| 72-1(a) | | | 72-4(b) | | | 124-2 | | |
| 72-1(b) | | | 72-5 | | | 141-1 | | |
| 72-1(c) | | | 72-6 | | | 141-2 | | |
| 72-1(d) | | | | | | 141-5 | | |

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

# DATA EVALUATION RECORD
## $EC_{50}$ TEST WITH *LEMNA GIBBA*
## GUIDELINE 122-2/123-2 (TIER I/II)

1. **CHEMICAL:** Pyriproxyfen (129032)

2. **TEST MATERIAL:** Pyriproxyfen (Sumilarv TG); 98.4%

3. **CITATION:**

| | |
|---|---|
| Author: | Hoberg, J. R. |
| Title: | Toxicity to duckweed, *Lemna gibba* |
| Date: | 1996 |
| Laboratory: | Springborn Laboratories, Inc., Wareham, MA |
| Lab. Report #: | 96-1-6354 |
| Sponsor: | Sumitomo Chemical Company, Osaka, Japan |
| MRID No.: | 439583-01 |

4. **REVIEWED BY:**

William Erickson
Biologist
EEB/EFED/EPA

Signature: W. Erickson
Date: 6/07/96

5. **APPROVED BY:**

Harry Craven
Section Head 4
EEB/EFED/EPA

Signature: Harry Craven
Date: 6/12/96

6. **STUDY PARAMETERS/RESULTS SYNOPSIS:**

| | |
|---|---|
| Definitive Test Duration: | 14 days |
| Type of Concentrations: | mean measured |
| $EC_{50}$: | >0.18 mg ai/l |
| 95% C.I.: | n/a |
| NOEC: | 0.18 mg ai/l |

7. **CONCLUSIONS:** The study is scientifically sound and fulfills the guideline requirement for a Tier I aquatic plant growth toxicity test with *Lemna gibba*. Because inhibition was <50% at a test concentration exceeding the maximum label application rate of 0.1 lb ai/acre, a Tier II test is not required.

8. **ADEQUACY OF THE STUDY:** Core for Tier I.

9. **MAJOR GUIDELINE DEVIATIONS:** None.

10. **SUBMISSION PURPOSE:** Registration.

11. MATERIALS AND METHODS:

**Test Organism:**

| Guideline Criteria | Reported Information |
|---|---|
| **Species**<br>*Lemna gibba* | *Lemna gibba* G3 |
| **Number of Plants/Fronds**<br>5 plants/rep; 3 fronds per plant. | 5 plants with 3 fronds per plant per replicate |
| **Nutrients**<br>Standard formula, e.g. 20XAAP | Hoagland's medium prepared w/sterile deionized water |

**Test System:**

| Guideline Criteria | Reported Information |
|---|---|
| **Solvent** | acetone |
| **Temperature**<br>25°C | 25 ± 1°C |
| **Light Intensity**<br>5.0 Lux (±15%) | 4300-5800 lux<br>(400-530 footcandles) |
| **Photoperiod**<br>Continuous | continuous |
| **pH**<br>Approximately 5.0 | 5.0 |
| **Test System**<br>Static or renewal | static |

**Test Design:**

| Guideline Criteria | Reported Information |
|---|---|
| **Dose range**<br>2X or 3X progression | 2X |
| **Doses**<br>at least 5 | 5 |
| **Controls**<br>negative and/or solvent | negative and solvent |
| **Replicates per dose**<br>3 or more | 3 |

| Guideline Criteria | Reported Information |
|---|---|
| Duration of test<br>14 days | 14 days |
| Observations made at least every 3 days? | yes |
| Maximum Labeled Rate | 0.1 lb ai/acre |

12. REPORTED RESULTS:

| Guideline Criteria | Reported Information |
|---|---|
| Initial and 14 day frond count? | yes |
| Control frond count at 14 day ≥2X initial count? | yes |
| Initial chemical concentrations measured? (Optional) | yes |
| Raw data included? | yes |

Dose Response for Frond Counts:

| Dose (mg ai/L) | Plant/Frond density | % Inhibition | 14-day pH |
|---|---|---|---|
| control | 392 | n/a | 6.0 |
| solvent control | 357 | n/a | 6.2 |
| 0.016 | 358 | 4 | 6.2 |
| 0.026 | 500 | -33 | 6.2 |
| 0.049 | 424 | -13 | 6.2 |
| 0.078 | 398 | -6 | 6.2 |
| 0.18 | 380 | -2 | 6.2 |

Statistical Results for Frond Counts:

Methods: n/a for $EC_{50}$
Williams' Test for NOEC
$EC_{50}$: >0.18 mg ai/l
95% C.I.: n/a
NOEC: 0.18 mg ai/l

**Other Findings:** At test termination, fronds exposed to the highest test concentration and to the solvent control were slightly chlorotic. Fronds exposed to all other test concentrations had reduced root formation when compared to the controls. Control fronds appeared normal throughout the test.

Frond biomass (dry weight) was also measured at test termination. Statistical analysis (Williams' Test) determined no significant reduction in frond biomass in any treatment level tested as compared to the pooled control.

13. VERIFICATION OF STATISTICAL RESULTS: Visual inspection of the data confirm that an $EC_{50}$ cannot be determined and that the NOEC is 0.18 mg ai/l.

14. REVIEWER'S COMMENTS: The study is scientifically sound and fulfills the guideline requirement for a Tier I aquatic plant growth toxicity test with *Lemna gibba*. An $EC_{50}$ value was not determined. However, because inhibition was <50% at a test concentration exceeding the maximum label rate of 0.1 lb ai/acre, a Tier II test is not required.